

**REMARKS**

Claim 1 has been amended to incorporate the subject matter of Claim 4. Claim 10 has been amended to incorporate the subject matter of Claim 12. Upon entry of this Amendment, which is respectfully requested, Claims 1, 3, 5-10 and 13-20 will be pending.

**Response to Claim Rejections Under § 112**

Claims 1, 3-10 and 12-20 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Without conceding the correctness of the rejection, Claims 1 and 10 have been amended to more clearly define the first and second metal components. Further, Applicants note that the first paragraph of Example 1 on page 15 in the specification refers to a TiOx/Zn composite thin film formed from a TiOx target and a Zn target, and it would be clear to one skilled in the art that Zn is an elemental metal. Thus, the present claims meet all of the requirements of §112. Accordingly, withdrawal of the rejection is respectfully requested.

**Claim Rejections Under § 103**

Claims 1, 3-10 and 12-20 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ando et al (U.S. Patent No. 6,738,203) in view of Kim et al (U.S. Patent Application Publication No. 2002/0144903) and Ito et al (JP No. 02240292). Applicants respectfully traverse.

The present claims are directed to a method for forming a porous thin film comprising a first metal component that is an elemental metal and metal compound portions composed of a compound of a second metal component different from the first metal component, wherein the first metal component is at least one metal selected from the group consisting of Zn, Cr, Al, Cu, Si, Ti, Ag, Mn, Fe, Co, Cd, Ni, Zr, Nb, Mo, In, Sn, Sb, Hf, Ta, W, and Mg, and the second metal

component is at least one metal different from the first metal component and selected from the group.

Ando discloses at col. 4, lines 18-23, that the optical power limiting material is basically characterized by comprising a transparent substrate and oxides of at least one metal selected from the group consisting of Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Nb, Mo, Ru, In, Sn, Sb, Ta, W, Re, Os, I and Bi. Ando fails to disclose or suggest utilizing an elemental metal.

According to the Examiner, the “transparent additive” of Ando corresponds to the presently claimed first metal. Applicants respectfully disagree.

Ando discloses at col. 7:

“The transparent additive component to be used in the present invention is not limited and include, for example, transparent oxides such as glass comprising  $\text{SiO}_2$  as a main component, quartz, sapphire comprising  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{ZrO}$  and like; transparent organic polymer materials such as an acrylic resin (e.g., polymethylmethacrylate, etc.), a polycarbonate resin, a polystyrene resin, a polyvinyl resin;  $\text{ZnSe}$ ; and the like. Preferred among the above examples are glass comprising  $\text{SiO}_2$  as a main component, quartz, sapphire comprising  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$  and the like; transparent organic polymer materials such as an acrylic resin (e.g., polymethylmethacrylate, etc.), a polycarbonate resin, a polystyrene resin, a polyvinyl resin and the like.”

Nowhere in the above disclosure does Ando disclose or suggest elemental metal, as recited in the present claims. Thus, the transparent additive of Ando does not correspond to the presently claimed first metal.

Moreover, Ando discloses the reason for using the claimed transparent additive component at cols. 6 and 7, wherein Ando discloses:

“The transparent additive component itself does not necessarily exhibit a strong optical power limiting effect as long as it has high optical transparency and the following function(s) as being composited with the metal oxide:

- (i) facilitating the metal oxide to form a thin film;
- (ii) improving optical power limiting effect of the metal oxide and/or
- (iii) increasing structural stability and mechanical strength of the thin film. The transparent additive component may preferably be low in the light absorption rate and high in the optical transparency as compared with the metal oxide. Addition of such component enables to obtain an optical power limiting material which is increased in the temperature only slightly even when an extremely strong laser beam is irradiated thereon.”

The above effects are quite different from the object and effects of the present invention, wherein a porous thin film formed according to the present invention has a high specific surface area. More particularly, an application of the presently claimed process is a method for forming a metal oxide semiconductor thin film for a solar cell electrode, thereby providing an organic-

dye-sensitized metal oxide semiconductor electrode having a high photoenergy conversion efficiency. Further, another application of the presently claimed process is a method for forming a photocatalyst thin film, thereby providing a photocatalyst thin film having a high specific surface area and containing highly distributed active sites. Ando fails to disclose or suggest these features of the present invention.

Ito is directed to an anodic oxidation of aluminum material with superior corrosion resistance wherein the surface of an Al (alloy) material is cleaned by degreasing with alkali etching and subjected to cathodic electrolysis. Ito is irrelevant to sputtering. More particularly, Ito discloses, in the abstract, that intermetallic compounds are effectively removed from the surface of an Al (alloy). In this regard, Applicants respectfully submit that “intermetallic compounds” generally mean compounds constituted by the two or more kinds of metals, and do not refer to a single “elemental metal” such as Zn, Cr and Al, as presently claimed. Thus, Ito fails to disclose or suggest removing the metal portions. Indeed, Ito teaches away from the present invention, including the advantages thereof.

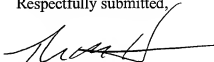
Kim fails to make up for the deficiencies of Ando and Ito discussed above.

Thus, Ando, Ito and Kim fail to render the present claims obvious. Accordingly, withdrawal of the rejection is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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